

WHAT IS CLAIMED IS:

1. Instrumentation for treatment of the spine, comprising:
an elongate member extending along a longitudinal axis and including a
deformable distal end portion having an initial configuration for placement adjacent a
5 spinal structure and a deformed configuration defining at least one transverse projection
for transverse displacement of at least a portion of the spinal structure.
2. The instrumentation of claim 1, wherein said transverse displacement of the
spinal structure is directionally-controlled.
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3. The instrumentation of claim 1, wherein said transverse displacement of the
spinal structure is uniaxial.
4. The instrumentation of claim 3, wherein said transverse displacement of the
15 spinal structure is unidirectional.
5. The instrumentation of claim 1, wherein said deformed configuration
defines a plurality of said transverse projections.
- 20 6. The instrumentation of claim 5, wherein said deformed configuration
defines a pair of said transverse projections disposed generally opposite one another.

7. The instrumentation of claim 1, wherein said deformation results from a mechanically induced force.

5 8. The instrumentation of claim 7, wherein said deformable distal end portion comprises a first member and a second member engaged with said first member; and wherein said second member is reformed from said initial configuration toward said deformed configuration by relative displacement between said first and second members.

10 9. The instrumentation of claim 8, wherein said relative displacement between said first member and said second member is relative linear displacement.

15 10. The instrumentation of claim 8, further comprising an actuator mechanism operably coupled to said first and second members to impart said relative displacement therebetween.

 11. The instrumentation of claim 1, wherein said deformable distal end portion is at least partially formed of a relatively flexible material.

12. The instrumentation of claim 11, wherein said deformable distal end portion is at least partially formed of a relatively elastic material.

13. The instrumentation of claim 12, wherein said relatively elastic material is a
5 shape-memory material.

14. The instrumentation of claim 12, wherein said deformable distal end portion is reformed from said initial configuration toward said deformed configuration in response to the imposition of stress, and is reformed toward said initial configuration
10 upon removal of said stress.

15. The instrumentation of claim 1, wherein the spinal structure is a vertebral body; and
wherein said transverse displacement comprises intrabody distraction of the
15 vertebral body.

16. The instrumentation of claim 15, wherein said intrabody distraction comprises compaction of cancellous bone to form a cavity within the vertebral body.

17. The instrumentation of claim 15, wherein said intrabody distraction comprises at least partial reduction of a compression fracture in the vertebral body.

18. The instrumentation of claim 1, wherein the spinal structure is a vertebral
5 body; and
wherein said transverse displacement comprises interbody distraction of the vertebral body.

19. The instrumentation of claim 1, wherein said initial configuration is sized to
10 pass through an access opening in the spinal structure having a diameter within a range of about 1 millimeter to about 5 millimeters; and
wherein said deformed configuration is sized to transversely displace the spinal structure within a range of about 3 millimeters to about 15 millimeters.

20. Instrumentation for treatment of the spine, comprising:
a first member;
a second member having a distal end portion engaged with said first member, said
distal end portion having an initial configuration for placement adjacent a spinal structure
and an expanded configuration for displacement of at least a portion of the spinal
20 structure; and
wherein relative displacement between said first and second members causes said

distal end portion to reform from said initial configuration toward said expanded configuration.

21. The instrumentation of claim 20, further comprising an actuator mechanism
5 coupled between said first and second members and being operable to impart said relative displacement therebetween.

22. The instrumentation of claim 21, wherein said actuator mechanism is
operable to reform said distal end portion of said second member from said expanded
10 configuration back toward said initial configuration.

23. The instrumentation of claim 21, wherein said actuator mechanism
comprises:

a first portion coupled to said first member; and
15 a second portion coupled to said second member and engaged with said first
portion; and

wherein relative rotation between said first and second portions imparts relative
linear displacement between said first and second members to cause said distal end
portion to reform from said initial configuration toward said expanded configuration.

24. The instrumentation of claim 23, wherein said first portion of said actuator mechanism comprises a T-handle.

25. The instrumentation of claim 20, wherein said distal end portion of said
5 second member is at least partially formed of a relatively elastic material to facilitate reformation from said initial configuration to said expanded configuration and back toward said initial configuration.

26. The instrumentation of claim 20, wherein said distal end portion of said
10 second member includes at least one outward deformation when in said expanded configuration.

27. The instrumentation of claim 26, wherein said distal end portion of said
second member includes a pair of said outward deformations positioned generally
15 opposite one another when in said expanded configuration.

28. The instrumentation of claim 20, wherein said distal end portion of said
second member comprises at least one flexible strip of material, said flexible strip of
material buckling outwardly in response to said relative displacement between said first
20 and second members to form said expanded configuration.

29. The instrumentation of claim 28, wherein outward buckling of said flexible strip of material occurs in a predetermined direction.

30. The instrumentation of 28, wherein said distal end portion of said second member comprises a pair of said flexible strips of material disposed generally opposite one another, said flexible strips of material buckling outwardly in response to said relative displacement between said first and second members to form a pair of said outward deformations disposed generally opposite one another.

31. The instrumentation of claim 28, wherein said flexible strip of material has a predetermined shape to provide controlled outward buckling.

32. The instrumentation of claim 31, wherein said predetermined shape includes a series of arcuate portions.

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33. The instrumentation of claim 20, wherein said distal end portion of said second member defines a plurality of slots, said slots facilitating outward buckling of said distal end portion in response to said relative displacement between said first and second members.

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34. The instrumentation of claim 33, wherein each of said plurality of slots has a predetermined shape to provide controlled outward buckling.

35. The instrumentation of claim 34, wherein said predetermined shape is at least partially comprised of an hour-glass shape.

36. The instrumentation of claim 20, wherein said distal end portion of said second member comprises a plurality of elements flexibly interconnected in series to form a reformable structure, said reformable structure being collapsible to define said insertion configuration and expandable to define said expanded configuration.

37. The instrumentation of claim 36, wherein said plurality of elements are elastically interconnected.

38. The instrumentation of claim 36, wherein said distal end portion has a substantially rectangular-shaped profile when in said insertion configuration and a substantially triangular-shaped profile when in said expanded configuration.

39. The instrumentation of claim 36, wherein said plurality of elements are disposed in a substantially uniform orientation when in said insertion configuration, and wherein at least some of said plurality of elements are disposed in a non-uniform

orientation when in said expanded configuration.

40. The instrumentation of claim 36, wherein said plurality of elements are integrally formed to define a single-piece reformable structure.

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41. The instrumentation of claim 36, wherein said second member includes a sleeve portion, said plurality of elements being coupled to said sleeve portion; and

wherein said second member is displaceable through said sleeve portion and engages at least one of said plurality of elements to transition said plurality of elements

10 between said initial configuration and said expanded configuration.

42. The instrumentation of claim 36, wherein an adjacent pair of said plurality of elements cooperates to define a laterally extending protrusion when in said expanded configuration.

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43. The instrumentation of claim 20, wherein reformation between said initial configuration and said expanded configuration is directionally-controlled.

44. Instrumentation for treatment of the spine, comprising:

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a member including a deformable distal end portion having an initial configuration for positioning adjacent a spinal structure and a deformed configuration for

displacing the spinal structure; and

means for mechanically deforming said distal end portion from said initial configuration toward said deformed configuration to displace at least a portion of the spinal structure in at least one predetermined direction.

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45. A method for treatment of the spine, comprising:

providing an instrument including a distal end portion, the distal end portion having an insertion configuration and a deformed configuration;

positioning the distal end portion adjacent a spinal structure while in the insertion configuration; and

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deforming the distal end portion toward the deformed configuration to displace at least a portion of the spinal structure.

46. The method of claim 45, wherein the deforming is directionally controlled.

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47. The method of claim 45, further comprising:

deforming the distal end portion back toward the insertion configuration; and removing the distal end portion from the spinal structure.

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48. The method of claim 45, wherein the deforming occurs in response to the imposition of a mechanically induced force.

49. The method of claim 45, wherein the distal end portion comprises a first member and a second member engaged with the first member; and

5 wherein the deforming occurs in response to relative displacement between the first member and the second member to outwardly deform at least a portion of the second member to form at least one laterally extending projection.

50. The method of claim 48, wherein the relative displacement comprises
10 linear displacement of the first member relative to the second member.

51. The method of claim 45, wherein the positioning comprises inserting the distal end portion through an outer wall of a vertebral body; and
wherein the distracting comprises compacting cancellous bone to form a cavity
15 within the vertebral body.

52. The method of claim 45, further comprising:
inserting a cannula through the skin and tissue of a patient;
positioning a distal end of the cannula adjacent the vertebral body; and
20 inserting the distal end portion of the instrument through the working channel
to access the vertebral body.

53. The method of claim 52, further comprising:
inserting a viewing element into the working channel of the cannula to provide
visualization of the vertebral body.